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Harnessing new technologies to achieve the Sustainable Development Goals

Report of the Secretary-General

Summary

New and rapidly developing technologies, such as artificial intelligence, biotechnology, robotics and renewable energy technologies, hold incredible promise for the advancement of human well-being, but they also have the potential to generate more inequality and more violence and have significant implications for the protection of human rights.

The present report is aimed at highlighting the great hopes and the great anxieties associated with new technologies, as well as at causing Member States and all actors to reflect on how to steer technology towards the implementation of the 2030 Agenda for Sustainable Development and the values, norms and standards agreed on at the United Nations, including the Charter of the United Nations and the Universal Declaration of Human Rights. Member States, civil society, international institutions and the business sector need to work together, guided by the common vision that we committed to in the 2030 Agenda, to harness technologies in order to achieve global good. The various intergovernmental bodies of the United Nations provide important forums through which to reflect on actions required by all stakeholders.

The United Nations system must adapt in order to enhance the support that it provides for efforts to harness technologies to achieve global good, through the platforms that it supports, its analyses and its operational activities for development. On the basis of consultations throughout the United Nations system, the Secretary-General has launched an internal strategy to strengthen the capacity of the United Nations to engage with and use new technologies in order to better deliver on its mandates and improve its support of Member States.

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The present report is submitted pursuant to General Assembly resolution 61/16, in which the Assembly decided that the Economic and Social Council should continue to promote global dialogue, including through a thematic discussion on a theme from the economic, social and related fields, to be informed by a report of the Secretary-General. Since the adoption of the resolution, the Council has engaged in a series of thematic discussions at its high-level segment on emerging issues that are relevant to the work of the Council.

I. Introduction

1. The current rapid pace of technological change has affected many aspects of development. Innovations in technology have already brought major changes in health care and other areas to many countries, hinting at a future of individualized medicine and reduced pandemics, globally disseminated knowledge and sustainable climate management, accelerated financial inclusion and entrepreneurship and even asteroid mining. Such changes have the potential to elevate the human condition everywhere. They offer us powerful new ways to achieve our shared commitment to the Sustainable Development Goals.

2. While such technologies hold great promise, they are not risk-free. Some inspire anxiety and even fear. They can be used to malicious ends and can have unintended negative consequences. They raise questions that are at the heart of the values of the United Nations, sustainable development, human rights and the future of humanity.

3. We are not powerless in the face of such complex changes. As a global community, we are driving change and are constantly pushing the frontiers of knowledge. It is within our power to gear frontier technologies towards global good and the kind of world that we want to see by 2030. It is up to us to come together to rethink our approach to policymaking, overhaul the way in which we encourage change, safeguard our values and plan for the long term. The present report is aimed at launching that process.

II. New technologies — promises and dilemmas

4. Technologies can support the shared goals of humanity. They provide us with powerful tools to realize the vision of the 2030 Agenda. Nevertheless, we must also be constantly alert to the risk that they can present to our common values. Moreover, some innovations and frontier technologies may not be viable catalysts for the progress of the Sustainable Development Goals, given their high cost. They may, in fact, divert resources away from solutions based on established and more financially viable technologies.

5. In the recent past, innovations played a catalytic role in advancing development objectives. That included tremendous achievements made since the start of the century in working towards the Millennium Development Goals. In the context of the Sustainable Development Goals, the diffusion of those technologies will continue to be critical, not least in addressing the unfinished business of the Millennium Development Goals in several critical areas.

6. Past innovations in health care, such as vaccines and medications, have significantly supported the achievement of the Millennium Development Goals through reducing child mortality, improving maternal health and combating disease. This is but one example of how increasing access to and reducing the cost of low-tech innovations will continue to have a significant impact on the betterment of human lives across the globe.

7. Innovations in medical technologies, in particular those relating to the use of information and communications technology for public health, commonly referred to as e-health, improve access to and the quality of health care. They provide us with the ability to gather, analyse, manage and exchange information in all areas of health, from research on molecular genetics, disease monitoring and personnel deployment to humanitarian interventions and disaster relief. They allow us to deliver basic health services to rural and remote communities, improve access to health-care education and facilitate the creation of early warning systems.

8. Several emerging technologies also move us closer to sustainable food systems and to producing food with adequate nutritional value. Such developments can now be achieved while safeguarding ecosystems and biodiversity, through the emergence of more knowledge-intensive and high-tech agriculture. New technologies can increase agricultural yields and resource efficiency, reduce pesticide use, limit food waste and help farmers to deliver better products to consumers.

9. New technologies, such as those deployed for e-learning, can also complement traditional education and learning. They can enhance learning, increase access to education, including for women and girls, and reach previously isolated and marginalized communities and vulnerable groups. Technologies are driving progress towards achieving the Sustainable Development Goals.

10. Solar energy and hydropower could generate electricity for the majority of the global population by 2030. For the more than 1 billion people currently living without electricity, an increase in global access will continue to be achieved through new grid and off-grid connections. Technologies should ultimately allow a move away from fossil fuels and towards renewable sources of energy.

11. There are proven technological benefits to taking action to mitigate climate change, such as the technology that allows for the development of electric vehicles. Inclusive and sustainable economic growth can drive development and, generate exciting new employment opportunities for all segments of society. The green economy is the economy of the future.

12. Green business can generate profits for entrepreneurs and benefits to society at the same time. It will also allow industries and manufacturers to foster more sustainable and efficient production methods. The use of robots will allow companies to enhance their value chains and better monitor processes in order to boost productivity and sustainability, thereby reducing waste and supporting more sustainable consumption patterns.

13. Innovative technologies can also play a crucial role in advancing progress on Goal 16, to foster peaceful and inclusive societies based on strong and transparent institutions. They allow people to obtain access to policymaking processes, including through e-government applications, and they facilitate access to public services. Artificial intelligence can help to curb illicit financial activity, including corruption and tax avoidance, by analysing and reporting suspicious monetary transactions.

14. Digital and mobile technologies, and the Internet, have enormous potential for women's empowerment. They can provide women with opportunities to obtain and share information, gain access to educational and health services, generate income, engage in networking and have their voices heard.

15. We must be cognizant, however, that, while advancing towards one Goal, we can hinder progress towards another. More generally, along with huge opportunities for achieving the Goals, technologies also bring some difficult questions, dilemmas and even threats.

16. Genetic engineering, for example, generates deep ethical questions in terms of its impact on all living creatures, human life included. With the exponential use of data in the area of health care comes issues relating to the maintenance of patient privacy and ownership and control over medical data. Online social networking allows us to find like-minded people around the world, thereby enlarging free speech and human creativity, but it also amplifies hate speech, contributes to ethnic and political polarization and facilitates the recruitment of terrorists. It can also intrude considerably on our individual privacy and human rights, sometimes at the risk of death.

17. Neural networks and deep learning offer the promise of instantaneous translation, bringing us all closer together. But they may also learn and amplify our biases, driving us further apart. The growth of the Internet and of the Internet of things offers significant economic opportunities, but it also raises the issues of security against intrusion and illegal surveillance. In many countries, people who take advantage of the benefits of information and communications technology often face emotional, psychological and physical threats in the form of cyberviolence.

18. While cyberspace has come to underpin almost every aspect of our daily lives, the scale and pervasiveness of "cyberinsecurity" is now recognized as a major threat. The political and technical difficulty of attributing and assigning responsibility for cyberattacks encourages actors to adopt an offensive posture, not only among States but also among non-State armed and criminal groups and individuals seeking to develop or obtain access to potentially destabilizing capabilities with a high degree of impunity. This situation could notably weaken the delicate balance and system of reciprocity that underpins much of the contemporary international security architecture.

19. While automation, artificial intelligence and robotics promise enhanced economic growth, they can also lead to underemployment or unemployment. That, in turn, could exacerbate inequality within and between nations. Several innovative technologies, such as robotics and automation, also threaten to be important drivers of wage inequalities.

20. In order to protect jobs and sustainable livelihoods, the answer to the challenges that relate to technology is not to stop developing labour-saving technology. Instead, that technology needs to be adapted to the way we work and the way that our societies function. We should also anticipate and plan for future trends, instead of responding to them when they appear, or when it is already too late.

21. Humankind sometimes appears to have entered a race against its machines, with ever fewer individuals able to understand, let alone programme, what the machines can do or are doing. New technologies and the application thereof will require massive investment in education and training. Our thinking about teaching, educating and training needs to be reassessed. Educational and training systems will no longer be focused only on how to do things, but also on how to learn things. There is a need for a structural shift towards preparing youth to acquire adaptive skills, including soft skills, problem-solving and the entrepreneurship acumen necessary for new forms of work. Teachers will increasingly serve as facilitators to support students' quest for new knowledge. At the same time, education will still require proven teaching and training methods, where "old and tested" methods will continue to be important.

22. There is a risk that new technologies, because of issues concerning the ownership and control thereof, may tip the balance further in favour of developed countries. Technological change can be a key contributor to growing inequality, perhaps more so than trade and financial globalization.

23. Artificial intelligence, robotics and machine learning are expected to make big contributions to the global economy, but most of the benefits could be accruing to industrialized and emerging economies. There is a risk that many economies in Africa, Latin America and Asia will benefit only marginally.

24. The lessons that we can learn from progress in health or education have one common feature: that the introduction of new technologies should never deter us from our pledge to leave no one behind, nor override the continuing role of "old" technologies, many of which are still beyond the reach of many developing countries.

25. The General Assembly, in its resolution 72/242, considered the impact of rapid technological change on the achievement of the Sustainable Development Goals,

including the issue of inequalities between countries that are likely to increase as a result of accelerating innovation.

III. Taking ownership of the future

26. Humankind is not powerless in the context of accelerating technological change. The role of policies and institutions will be of great importance in this respect.

Governance

27. To harness the opportunities provided by new technologies, the international community needs to work together, plan ahead and act with not only great urgency but also wisdom, and must accept that current practices may not be sustainable.

28. Many technologies are designed, developed and deployed on infrastructures or in spaces that remain beyond any single State's jurisdiction. Increasingly, the decisions that shape the public's everyday experiences can be influenced by software codes. They are made not by elected officials in parliaments, but by scientists and innovators in private settings. The choices of all these actors will resonate in the coming generations, and not all of the impacts are clear.

29. At the same time, it is difficult for any one entity to keep up with the pace of technological change and its complexities.

30. In view of the above, there is a need to change the approach to making policies and developing safeguards. The way forward is to work in a multi-stakeholder context, bringing together Governments, innovators, investors, the private sector, civil society, scientists and all other actors. We need to hear different perspectives, share knowledge, discuss ways forward and engage in alliances and partnerships in order to accelerate the response to and keep up with the pace of change.

31. The private sector hosts many capacities for innovation, providing the financial means and frontier technologies that can advance the implementation of the Sustainable Development Goals. We need to engage companies and enterprises in order to shape our common future. Many major businesses have already embraced the Goals as part of their objectives.

32. Scientists, members of academia and researchers can also help to navigate the complexities of such innovation. They can enable us to look into the near and remote future and anticipate future frontier technologies and their impact. They can also develop projections and scenarios to outline what should be done today to realize the promise of new technologies.

33. Engagement with the best minds, across all disciplines, will be needed in order to develop ideas about overhauling and redesigning education, health and social systems so that they are equipped to respond to the major changes that will be witnessed in terms of employment and many other facets of life.

34. Beyond that, communities, institutions and individuals must have a chance to speak and contribute. The changes ahead will deeply influence the way that time is divided between work and social life. A conversation must take place on the evolution of our societies, to be conducted in the context of a broader discussion on demographic shifts that are shaping our collective future, such as ageing, changes in population movements and trends in people's trust in their institutions. It is essential that all such issues be discussed, as they have, thus far, have been largely ignored in the public debate.

Responsibilities of Governments

35. The issues outlined above do not mean that Governments have a smaller role. On the contrary, they drive joint efforts towards shaping policies and safeguards and are pivotal to keeping the compass on common commitments and values, opening spaces for debate among all actors and acting on the basis of people's needs.

36. It is also within the realm of policymakers to create enabling environments to foster innovation while defining the rules for research and for the introduction of new technologies. The international community should embrace innovative policy incentives, frameworks and systems that can ensure respect for critical human rights and values while at the same time promoting research, innovation and entrepreneurship in areas relevant to the Sustainable Development Goals.

37. New digital technologies and approaches, as well as regulation, can also help to address the issues surrounding the privacy, security, quality and sharing and exchange of data and, more generally, public trust in data for policy purposes.

38. The public sector also continues to play an important role in creating new technologies and directly promoting innovation and technological change in support of sustainable development. Governments funding for research and development must be geared towards the kinds of projects that will offer solutions with regard to realizing the Sustainable Development Goals.

Embarking on new paths

39. Many countries and regions are already moving ahead with efforts to address the risks associated with information and communications technology. In 2014, the African Union adopted the African Union Convention on Cyber Security and Personal Data Protection, which set forth the security rules essential for establishing a credible digital space for electronic transactions, protecting personal data and combating cybercrime.

40. In 2015, the Regional Forum of the Association of Southeast Asian Nations developed a workplan on the security and use of information and communications technology in order to set out measures aimed at promoting a peaceful, secure, open and cooperative information and communications technology environment and preventing conflict and crises by developing trust and confidence among States in the Forum region and by capacity-building.

41. In April 2017, the European Commission adopted an approach to not only increase public and private investment in artificial intelligence but also to ensure that appropriate ethical and legal frameworks are in place. In addition, extended coverage of the General Data Protection Regulation applies to all companies processing the personal data of subjects residing in the European Union, regardless of the company's location.

42. In order to accelerate efforts in this regard, best practices must be shared and the urgency of taking measures to plan for the best and to prepare for unintended negative consequences cannot be overemphasized. Together, the international community can ensure that innovation is not about the latest gadgets but about building a better future for humanity and the planet.

United Nations platforms

43. The United Nations platforms must adapt in order to provide a space in which Member States can come together with all actors to discuss frameworks, exchange good practices and reflect on where protocols, principles or other mechanisms or incentives are needed.

44. A number of United Nations intergovernmental or multi-stakeholder mechanisms have already launched such efforts.

45. The Technology Facilitation Mechanism, in particular through the annual multi-stakeholder forum on science technology and innovation for the Sustainable Development Goals, is central to discussions on the impact of rapid technological change. The forum is supplemented by an online platform that serves as a gateway for information relating to science, technology and innovation.

46. The Internet Governance Forum serves as a critical multi-stakeholder platform for discussions on how to adapt the Internet to support an information society centred on human beings and their rights. The World Summit on the Information Society Forum also maintains the focus of the information technology community on those broad objectives. In addition, the Commission on Science and Technology for Development gathers together Governments and other stakeholders to share views and practices on critical policies and new issues and frameworks. The Artificial Intelligence for Good Global Summit also helps to bring international attention to critical issues relating to artificial intelligence.

47. Several instruments, including the recently established Technology Bank for the Least Developed Countries, have been established to promote the use of technology in order to realize the Sustainable Development Goals.

48. The international community must build on those forums, tools and mechanisms to ensure that actions and policies regarding new technologies are geared towards achieving the global good. They must be relentlessly aimed at improving living conditions in developing countries.

49. International cooperation must embrace new approaches and expand and share knowledge and technology. It should remain firmly anchored in the priority of promoting sustainable development in the poorest countries and leaving no one behind. The technological gap between richer and poorer countries must be closed, which also means overcoming the barriers faced by many countries, communities and firms, and boosting capacities for innovation and the diffusion of new technologies.

IV. Adapting the United Nations system to leverage new technologies for sustainable development

50. Rapid technological advances, such as those outlined in the present report, leave the international community with important choices. The decisions made will have important political, security, socioeconomic and ethical implications. As such, they need to involve a wide range of perspectives from across the globe, and lasting consensus must be based on a level playing field. The United Nations is committed to supporting multi-stakeholder dialogue and consensus-building on those choices and decisions, but in order to play a meaningful role as an inclusive and effective platform for collaboration, the Organization must strengthen its own capacity to engage with new technologies and new technology actors. For that reason, the Secretary-General has initiated broad consultations internally and with external experts to define a United Nations strategy on new technology, designed as an internal call to action for increasing awareness and knowledge of new technologies and their impact, and related skills.

51. In particular, the United Nations needs to upgrade its own understanding of how new technologies affect respective mandates, learn whether and how the Organization can use new technologies to improve mandate delivery and/or internal management efforts and determine what can be learned from our experiences to inform support to Member States and other actors. The strategy will be implemented on the basis of key

principles, including the need for the work of the United Nations on new technologies to protect and promote global values and for its support to be grounded in the Charter of the United Nations, to foster inclusion and transparency at all times, to promote partnership and to build on existing mandates and capacities. The strategy will highlight a series of very practical actions that United Nations leaders and their teams need to take in order to deepen internal capacities and exposure to new technologies; increase our understanding, advocacy and dialogue; support exchanges on normative and cooperation frameworks; and enhance our support of national or regional capacity development efforts.

52. The strategy will reflect the desire for the United Nations to be both humble and ambitious: humble, because the issues are complex and the United Nations must keep listening to and learning from a wide range of people and institutions, and ambitious, because the stakes are high and the United Nations can play a critical role in promoting dialogue among different actors and ensuring that our collective values, enshrined in the Charter, remain at the core of the decisions that will shape our future.

V. Conclusion

53. The collective questions that frontier technologies lead us to are centred on values, rights, dignity and cooperation. We must explore how we can ensure that new technologies are anchored in the values of the Charter and the Universal Declaration of Human Rights and how they can help us to promote the Sustainable Development Goals and build a better future.

54. In addition, we need to discuss ways in which to ensure that the benefits of new technologies are promoted while their risks are mitigated. We must address how we will support those who lose their jobs to new technology and, at the larger social level, how we can ensure that shifts in power based on new technologies do not threaten international peace and security or the enjoyment of human rights.

55. Today and in the coming months, I am calling for global attention to be focused on the collective questions that technological innovation compels us to face. I encourage the United Nations, Member States, industry, academic and civil society leaders and international organizations to prepare adequately to harness and adapt to the transformational impact of new technologies.

56. Furthermore, we must focus on ensuring that inequality does not increase further, in particular in view of the fact that new technologies are developing mostly in a small set of countries and among a small set of organizations. The digital world and the dazzling speed of new innovations remind us daily that our mission to leave no one behind has become increasingly necessary and urgent.